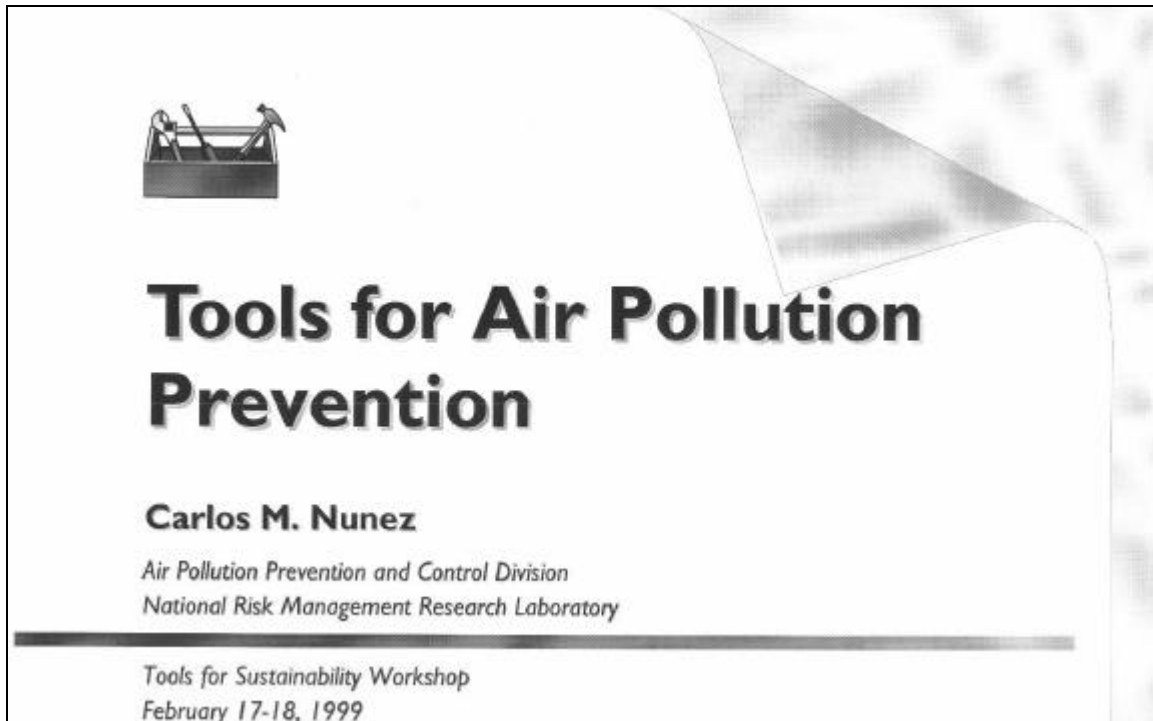


Tools for Finding Lower Volatility Products

Slide Presentation



APPCD's Tool Box

- ▶ *Software to Help Small- & Medium-Sized Businesses, State Technical Assistance Programs, & Local Municipalities Identify Lower-Emitting Alternatives which Prevent Air Emissions*
 - *Supports Implementation of Clean Air Act*
 - *Multimedia Consideration*
- ▶ *Methods and Models to:*
 - *Evaluate Emissions from Products*
 - *Characterize Material & Equipment Performance*

APPCD's Tool Box

- ▶ *Surface Treatment*
 - *Solvent Alternatives Guide (SAGE)*
 - *Coating Alternatives Guide (CAGE)*
 - *Adhesive Alternatives Guide (AAGE)*
- ▶ *Indoor Air Source Characterization*
 - *Small Chamber Emissions Test Method (ASTM)*
 - *Test Methods for Variety of Sources*
- ▶ *Integrated Waste Management*
 - *Decision Support*
 - *Life Cycle Database*
- ▶ *Global Climate Change*
 - *Tool to Compare Cost & Performance of Greenhouse Reduction Technologies*



SAGE

- ▶ *Process Selection or Electronic Handbook First Released in 1993*
- ▶ *An Immediate Success with Over 20,000 Copies Distributed World Wide*
- ▶ *Assists the Process Engineer to Identify and Design an Environmentally Compliant Surface Cleaning Process*
 - *General information on solvent and process alternatives for cleaning and degreasing*
 - *Comprehensive list of existing and new cleaning technologies and ideas for minimizing waste*
 - *Links to environmental and technical assistance contacts*
- ▶ *31 Known and Demonstrated Cleaning Options*
- ▶ *Rated 5 Out of 5 by The GreenBusiness Letter as a "well-designed system"*
- ▶ *Available via EPA's EnviroSense or <http://sage.rti.org>*



SAGE

Approach

- ▶ *Determine User Piece Part Parameters with Question & Answer Format to Assess:*
 - *Material*
 - *Cleanliness Level*
 - *Coating*
 - *Type of Soils*
 - *Shape*
 - *Current Equipment*
 - *Size*
 - *Current Chemistry*
 - *Production Volume (Cycle time)*
- ▶ *Derive Chemistry Recommendations*
- ▶ *Derive Process Recommendations*
- ▶ *For further information, contact Chuck Darwin at 919/541-7633 or cdarvin@engineer.aeerl.epa.gov*



- ▶ *An Expert System and Information Base Available on the Internet at **<http://cage.rti.org>***
- ▶ *Information Dissemination on Low-Emitting Coating Technologies for Metal and Plastic Parts and Products*
- ▶ *Provides Information for Small- & Medium-Sized Businesses & State Technical Assistance Programs on:*
 - *Alternative Coatings and Coating Application Equipment*
 - *Cost of Alternatives (under development)*
- ▶ *Unique in matching low-polluting coatings to existing process lines*
 - *31 Generic Coatings*
 - *11 Equipment Types*
- ▶ *Named Web Site of the Week (8/96) by American Electroplaters and Surface Finishers (AESF)*



Approach

- ▶ ***Asks User Questions About Current Coating Process***
 - Substrate
 - Cleaning
 - Pretreatment
 - Coating Function
 - Application Technique
 - Curing Method
 - Coating Properties
- ▶ ***Provides Relative Rankings of Alternative Coatings and Coating Equipment***
 - Each coating receives an increment/decrement for each answer for each relevant question
 - Increment/decrement based on information base and "expert" opinion
- ▶ ***Analyzes Economics of Process Conversion to Alternatives (under development)***
- ▶ ***For further information, contact Mike Kosusko at 919/541-2734 or mkosusko@engineer.aeerl.epa.gov***

AAGE

Adhesives Alternatives Guide

- ▶ *Interactive Software Application to be Available on the Internet*
- ▶ *Information on Alternatives to Solvent-Based Adhesives*
 - *Tapes & Labels*
 - *Flooring*
- ▶ *Provides Information to Industry (especially small business) and Regulatory Agencies on alternate products and techniques to reduce VOC and air toxic emissions*

AAGE

Adhesives Alternatives Guide

Approach

- ▶ *Identifies viable, alternative materials and technologies that reduce air emissions of VOCs and associated hazardous air pollutants (HAPs)*
- ▶ *Provides the tools to analyze the feasibility of engineering designs and costs associated with various alternatives*
- ▶ *Provides qualitative and quantitative reports on the performance, design, application, costs, economics, emissions, and health and safety aspects of P2 technologies that offer the potential for reducing VOC/HAP emissions associated with the use of adhesives*
- ▶ *For further information, contact Chester Vogel at 919/541-2827 or cvogel@engineer.aeerl.epa.gov*

Small Chamber Test Method for Indoor Products/Materials

- ▶ *ASTM Published APPCD's Small Chamber Methodology, Small Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials and Products*
- ▶ *Used by Industry (Product Development and/or Evaluation); Private Sector (Materials Testing and Selection); and Regulatory Agencies (Standards and Building Codes)*
- ▶ *Technical Guidance on Method has been Provided to:*
 - *Industry-Allied Fibers, Amway, Armstrong, BASF, Ciba-Geigy, Dupont, Georgia-Pacific, Interface, Johnson Wax, and Monsanto.*
 - *Industry Groups-American Particleboard Association, Carpet and Rug Institute, and Textile Manufacturers Association.*
 - *Consultants and Researchers-Air Quality Sciences, Geomet, Georgia Tech, Lawrence Berkeley Laboratory, Lockheed, Research Triangle Institute, and Underwriters Laboratories.*
 - *International-Australia, Canada, Denmark, Finland, France, New Zealand, and Sweden.*

Test Methods for Paints

- ▶ *Developed Small Chamber Test Methods Specifically for Latex Paint and for Alkyd Paint (Evaluated Substrate, Amount of Paint Applied, Chamber Air Velocity, Humidity, Air Exchange)*
- ▶ *Methods Used to Support:*
 - *OPPT DfE*
 - *Industry*
 - *Indoor Air Source Ranking Database*
- ▶ *Method Used by APPCD to Evaluate "Low VOC" Paints*
 - *Two of the four paints had elevated formaldehyde emissions*
 - *Results provided to industry for product reformulation*

Test Method for Photocopiers

- ▶ *Developed and Evaluated Emissions Testing Guidance Document for Dry-Process Photocopiers*
- ▶ *Results of Triplicate Runs and a Four-Lab Study Show That Method Is Acceptable for Measurement of VOCs, Aldehyde/Ketones, and Ozone*
- ▶ *Method Used by Private Testing Company for Emissions Testing of Copiers, Laser Printers, Fax Machines, etc. for Manufacturers and Users of the Equipment*
- ▶ *Contacted by Copier Manufacturer for Guidance on Test Chamber Design*
- ▶ *Identified Toner as Primary Emission Source and Potential for P2 (Follow up Toner Study by APPCD)*

Methods for Evaluating and Reformulating Aerosol Consumer Products

- ▶ *Developed and Evaluated "Aerosol Mass Spectral Interface" to Chemically Characterize Aerosols Through Space*
- ▶ *Understanding Chemical Composition & Changes Through Space Can Assist Manufacturers with Product Reformulation*
 - *Detection of contaminants in raw materials*
 - *Identification of chemical reactions*
 - *Effect of propellant on particle size distribution*
 - *Effect of room ventilation on particle distribution*
- ▶ *Developed Spray Nozzle Design That Removes the Need for VOC Solvents and HC Propellants*
 - *Uses an intimate mixing of product with atomizing air & incorporates a porous insert at dispenser exit for smaller drop size*
 - *Insensitive to product viscosity & surface tension*

Integrated Waste Management Tools

- ▶ *Developed (with extensive peer review and interaction with stakeholders representing industry, state & local government and NGOs):*
 - *Decision support tool and*
 - *Life-cycle database for North America*
 - *Community and state case studies*
- ▶ *Tools will help identify integrated waste management strategies that minimize both costs incurred by local governments and environmental impacts on local communities, regions, or society as a whole*

Integrated Waste Management Tools

- ▶ *Life-cycle database is stand alone and will be a publicly available life-cycle dataset for North American including:*
 - *Manufacturing LCI data for aluminum, steel, glass, paper (6 types) and plastic (4 types)*
 - *Emission factors (air, water, solid waste) for waste management activities*
 - *Emission factors for equipment (such as front-end loaders)*
- ▶ *Worked very closely with industry, NGOs and others to develop this peer-reviewed database and supporting documentation*
- ▶ *For further information, contact S. Thorneloe at 919/541-2709 or Thorneloe.Susan@epa.gov*

Greenhouse Gas Technology Comparison Tool

- ▶ *Addresses All Greenhouse Gases within Regional and/or Global Territories*
- ▶ *Useful for Evaluating Future Year Impacts of Technology Options from All Sectors (not just energy supply/demand)*
- ▶ *Under Development Along with a Separate Database of Information on Technologies*
- ▶ *Include Information on Cost and Co-benefits for Other Pollutants*
- ▶ *For further information, contact Cynthia Gage at 919/541-0590 or cgage@engineer.aeerl.epa.gov*